

INDUSTRIAL ENERGY EFFICIENCY INSTALLATIONS

Case Studies in the Pacific Northwest

Apple Storage Costs Reduced (2002)

Project: A large Northwest orchard installed efficiency improvements including a carbon dioxide (CO₂) scrubber used in fruit storage.

Why this project was done: After the five-month growing season, apples are harvested, sorted then shipped or stored to send to the market later. Stored fruit is kept in a controlled atmosphere where it is refrigerated to 33° F with low

oxygen content (approximately 2 percent of oxygen). Under this environment, the apples stay fresh and crispy for several months. Controlled atmosphere storage refrigeration creates huge energy bills for the fruit business. Local financial incentives spurred managers to install an energy efficient scrubber.

Result: The CO₂ scrubber reduced the operational hours of

the 200-horsepower nitrogen generators. The orchard generated over 500,000 kWh in annual energy savings, which translates to \$22,000 in former energy costs. They also received a payment of \$60,000 from their utility, which gave a net result of a payback in under two years. Installations improved control of the oxygen level, which improved the taste of the apple. ▀

Water-Wastewater Technology (2001-2002)

Project: Municipality contracted with BacGen Technologies to make changes at the water/wastewater plant. Customized software now runs system loading, aeration, nutrient removal, disinfection and pumping systems. Overall system efficiency improvement includes upgrades to plant equipment such as pumps, blowers, motors and piping.

Why this project was done: The town faced a major problem: their water and wastewater facilities faced capacity loads and the threat of high fines for violating the Environmental Protection Agency's (EPA) dis-

charge guidelines. Curtailing energy costs was another priority. The town council decided that investing in piping and motor change-outs at the same time as installing the BacGen optimization technologies constituted a prudent business choice and a wise use of taxes and ratepayers money.

Result: Energy savings have been verified at 40 percent. The community noticed a reduction in operating costs that yielded a good payback on their share of the investment. The improved facility meets EPA and state environmental regulations, and

the efficient system can handle future community growth. In addition, a remote monitoring system increased the compliance capability and control and now the plant is less vulnerable to dynamic system changes.

Municipal savings and other benefits are causing other townships and industries with similar facilities to take a closer look. ▀



Three Projects at Montana Wood-Products Plant (2001-2003)

Project 1: The wood products plant made compressed air system improvements including larger sized and improved layout of piping. They replaced an existing air dryer with an internally heated regenerative air dryer.

Project 2: A variable speed drive was installed on the boiler induced draft fan.

Why these projects were done: The facility was facing increasing energy costs and energy audits indicated that process system improvements would reduce energy use. Local financial incentives were available.

Results: Though project 1 incurred costs of \$60,027, it resulted in the verified annual savings of 358,000 kWh/yr. Project 2 incurred costs of \$88,000 and achieved a verified annual energy savings of 911,000

kWh/yr. The utility purchase of energy savings from both projects offset the actual costs to the plant.

Project 3: Air dryer retrofit plus installation of 8-inch air piping around the plant.

Why this project was done: Medium density fiberboard, a major wood product, requires air dryers that use a great deal of energy. An energy audit indicated savings would be achieved by retrofitting the motors, and local financial incentives were available. Management decided to seek extra savings based on a training class presented by the Northwest Energy Efficiency Alliance and the Department of Energy. They invested in additional retrofits by adding an air-piping project described in the Pumping Systems Assessment Tool, which stressed the impor-

tance of removing impedance to fluid flow.

Result: Though the project incurred costs of \$165,000, it achieved a verified annual energy savings of 802,000 kWh/yr. In addition, the large-sized compressed air piping with an improved layout allows the plant to run only five or six compressors to supply the air needs. The plant gets over double the original estimated savings of 332,000 kWh/yr. ▀

Wood Industry Makes Changes (2002)

Project: Wood plant retrofits included air compressor controls, dryer dew-point monitoring, automatic drain traps, dedicated air compressor for fire protection system, and improve blower applications.

Why this project was done: Management had to replace old equipment, and energy audits indicated that efficiency products would reduce energy use. Local financial incentives were available.

Result: Over 1.5 million kWh of savings were verified in the first year following the retrofits. ▀

Cooling Tower Converts to Energy Savings (2002)

Project: An industrial gas products manufacturing plant optimized their cooling tower control system with variable speed fans and energy efficient motors.

Why this project was done: Evaluations indicated that the existing cooling tower has energy

losses and investing in changes could capture significant energy savings. That knowledge, plus a local financial incentive won this project a *green light*.

Result: The retrofits captured 600,000 kWh in energy efficiency this first year, saving approximately \$18,000 in energy costs. ▀